APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/652,322	08/31/2000	Shubhendu S. Mukherjee	1662-27300 (P00-3094)	2964

			EXAMINER
22879	7590	04/07/2004	NGUYEN, QUANG N

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

ART UNIT	PAPER NUMBER
2141	10

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>25 March 2004</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-24 and 26-29</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-24 and 26-29</u> is/are rejected.

7) ☒ Claim(s) <u>25</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>12 February 2002</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: ____.

Detail Action

1.   This Office Action is in response to the Amendment A filed on 03/25/2004.

Claims 1-3, 14 and 23 have been amended. Claims 25-29 have been added as new

claims. Claims 1-29 are presented for examination.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   **Claims 1-5, 13-14, 22-24 and 26-29 are rejected under 35 U.S.C. 103(a) as**

being unpatentable over Passint et al. (US 5,970,232), herein after referred as

Passint, in view of Gotwald (US 5,987,518).

4.   As to claim 1, Passint teaches a distributed multiprocessing computer system,

comprising:

a plurality of microprocessor units *(i.e., a plurality of scalable interconnect network units 28/128 of Figs. 2/3)* coupled to each other, wherein each microprocessor unit comprises:

a router *(router 50 of Fig. 2 and Fig. 18)* to route message packets between said microprocessor units, and wherein said router prioritizes message packets based upon age of the message packet (Passint, C11: L55-64);

a plurality of network input ports and network output ports *(network ports 52-66 of router 50 in Fig. 2 and Fig. 18)* connecting said plurality of microprocessor units to form a computer network, wherein each of said network input ports couples to one or more associated local arbiters *(router receive block 102 of Fig. 18)* in the router, each of said local arbiters operable to select a message packet among message packets waiting at the network input port *(router receive block 102 accepts data, manages virtual data channels, dynamically allocated memory queues, bypass logic, and fairness logic which ages packets when they fail to make progress, forwards data to router tables 104 and 106 and a router send block 108 which drives data into LLP block 100 for transmission)* (Passint, C5: L47-67, C6: L1-8 and L40-67, C7: L1-15, C10: L27-67 and C11: L1-4).

However, Passint teaches router 50 routing message packets according to the packet header information and information from the local and global router tables that includes source/destination addresses, data information, control information, age information, etc., but does not explicitly teach prioritizing message packets based upon type and source of the message packet.

In the related art, Gotwald teaches a prioritization scheme wherein different messages are prioritized according to at least one of source address, destination address, data type and/or connection type (Gotwald, C4: L62-67 and C5: L1-16).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Passint and Gotwald to prioritize message packets based upon type, age and source of the message packet since such prioritization methods were conventionally employed in the art of prioritizing the message packets for routing in multiprocessors computer systems to preserve the fairness in packetized data transmission via a switched router architecture.

5.   As to claims 2 and 28, Passint-Gotwald teaches the system of claim 1, wherein a message ages each time it is stored in a virtual channel buffer (of a router). The longer the message waits, the more it ages until the aging limit is reached, where the upper age values are reserved for fixed high priority packets and the priority for transmission is given to older messages *(i.e., said router inherently includes a plurality of timers implemented as starvation and drain timers that indicate when a message packet must be immediately dispatched)* (Passint, C11: L55-64).

6.   As to claim 3, Passint-Gotwald teaches the system of claim 1, wherein said microprocessor unit further includes a plurality of microprocessor input ports and output ports *(network ports 52-66 of router 50)* that allow the exchange of message packets between hardware functional units in the microprocessor and between microprocessors.

7.   As to claim 4, Passint-Gotwald teaches the system of claim 3, wherein each of said microprocessor input ports couples to local arbiters in the router, each of said local arbiters able to select a message packet among message packets waiting at the microprocessor input port *(router receive block 102 accepts data, manages virtual data channels, dynamically allocated memory queues, bypass logic, and fairness logic which ages packets when they fail to make progress, forwards data to router tables 104 and 106 and a router send block 108 which drives data into LLP block 100 for transmission)* (Passint, C10: L27-49).

8.   As to claim 5, Passint-Gotwald teaches the system of claim 4, wherein each of said network output ports and microprocessor output ports couples to a global arbiter *(arbiter block 110 of Fig. 18)* in the router that selects a message packet from message packets nominated by the local arbiters of said network input ports and microprocessor input ports *(i.e., nominated by ports 52-66)* (Passint, C10: L27-67 and C11: L1-4).

9.   As to claim 13, Passint-Gotwald teaches the system of claim 5, wherein said network or microprocessor output port global arbiter selects said message packet Least-Recently-Granted from the network input ports, then Least-Recently-Granted from the microprocessor input ports *(i.e., ports which are not used/selected during the first level arbitration have a second chance to be granted by the second level or bypass arbiter)* if said network or microprocessor output port is idle (Passint, C10: L27-67 and C11: L1-4).

10.   Claims 14 and 22 are corresponding method claims of system claims 1 and 13 with the addition of wherein operation of said means for selecting and transmitting reduces routing latency *(i.e., low latencies)* of the distributed multiprocessing computer system *(Passint, C18: L57-67 and C19: L1-9)*; therefore, they are rejected under the same rationale.

11.   Claim 23 is a corresponding "means" claim of method claim 14; therefore, it is rejected under the same rationale.

12.   Claim 24 is a combination claim of claims 1 and 3 with the addition of a disk drive coupled to each of said plurality of microprocessors (Gotwald, disk drive 14 of Fig. 2); therefore, it is rejected under the same rationale.

13.   As to claims 26-27 and 29, Passint-Gotwald teaches the system of claims 5 and 24, wherein said router prioritizes message packets based on the source of the message packet *(i.e., the source address of the message)* and based on an input port hierarchy comprises the router giving message packets associated with network input ports *(associated with routing information contained in the global router table)* higher priority than message packets associated with microprocessor input ports *(associated with routing information contained in the local router table)* (Gotwald, C4: L61-66; Passint, C8: L32-47, C12: L51-63 and C14: L41-58).

14.   Claims 6-12 and 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Passint, in view of Gotwald, and further in view of Miller et al. (US 6,282,195), herein after referred as Miller.

15.   As to claims 6-12, Passint-Gotwald teaches the system of claim 5, but does not explicitly teach if a (from first to seventh) message packet type is ready to be dispatched from the network or microprocessor input port, the local arbiter requests service for the message packet type from the global arbiter of the destination network or microprocessor output port.

In the related art, Miller teaches a switched router for transmitting packetized data concurrently between a plurality of devices coupled to the I/O ports of the switched router based upon destination and source ID, packet type *(Miller, 7 packet types, C5: L2-20)*, transaction number, data size, arbitration and control bits, wherein a ready-for-dispatched message packet type is waiting for the request manager 407 in the source link controller 401 *(i.e., the global arbiter)* to check the status of the destination port and the priority of the message packets in the queue to determine which of the packets in the input packet buffer 406 has the highest priority to select to enter the arbitration phase (Miller, Fig. 4 and corresponding text, C12: L2-35)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Passint-Gotwald and Miller to request service for the ready to be dispatched message packet type from the

global arbiter of the destination network or microprocessor output port since such requests were conventionally employed in the art to allow the system facilitating the most efficient and advantageous handling of packetized data transmission in switched routing scheme to preserve the fairness in prioritizing the message packets based on various criteria such as type, age and source of the message packet for routing in multiprocessors computer systems and to avoid deadlock or starvation to happen.

16.   Claims 15-21 are corresponding method claims of system claims 6-12; therefore, they are rejected under the same rationale.

Allowable Subject Matter

17.   Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18.   Applicant's arguments as well as request for reconsideration filed on 03/25/2004

have been fully considered but they are moot in view of the new ground(s) of rejection.

19.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action.   Accordingly, **THIS ACTION IS MADE FINAL**.   See MPEP

§ 706.07(a).   Applicant is reminded of the extension of time policy as set forth in 37
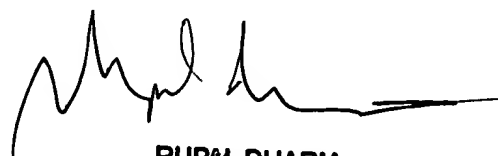
CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action.   In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action.   In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

20.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang N. Nguyen whose telephone number is (703) 305-8190.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's SPE, Rupal Dharia, can be reached at (703) 305-4003. The fax phone number for the organization is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800/4700.

Quang N. Nguyen

RUPAL DHARIA
SUPERVISORY PATENT EXAMINER